

Be Positive – An Android Application for Blood Donation

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Abstract: *With the entire nation driving itself towards a digital core it is essential that medical assistance doesn't lag behind. In cases of emergency people often require a certain degree of health assistance (blood to be precise) and they may or may not get that depending on the situation and their location. What we can achieve is a small but certain contribution to that field using this project. From this project, our aim is to provide an application that will benefit patients in critical situations like requirement of a specific type of blood. This will reduce the overhead of finding a blood donor in a nearby location during emergency situations. Thus connecting blood donors and recipients is our prime focus.*

Keywords : blood donation, android app, m-health, social cause, emergency, donor connectivity, donor database

I. INTRODUCTION

It was observed that there was no specific platform that allows people to search for a specific blood donor in the nearby vicinity. People used other means of communication such as social media platforms and messaging application to spread the word, but this leads to uncontrollable and unreliable spamming. There has been a massive surge in the number of smartphone users, specifically android users. Hence the target domain is android itself. This will allow to connect maximum amount of potential donors.

The system is divided into an Android application connected to a Backend as a Service. The major benefit of this application will be to provide an efficient app based facility for searching blood donors and recipient. This concept will provide its users an easy and convenient way to find blood donors. For the user the only task is to keep updating his/her donation details (date and location) after every donation. The app will provide a real time sync facility to its users where a feed will be displaying all the requests for blood in their area. All the users' details will be stored efficiently in a backend service called Firebase which holds a NoSQL database and data is stored in Key-value pairs. Each user will have his own unique hash key that will be used to identify that particular data node when needed in the future.

The app resides majorly in the Backend as a Service domain. It will be based upon Firebase which allows developers to build an application right from scratch including its security licenses and databases.

Firebase provides this storage facility free of cost till a certain threshold of usage and allows it for up to 100 concurrent users. It also supports up to 10 Gigabytes of data transfer throughout your database with an additional 1 Gigabyte as a storage option.

A combination of this backend with Android makes a very efficient and reliable application possible with almost any feature necessary for it. Unlike cloud services this method saves plenty of resources and extra usage as well. The application will be

posted as an Open Source project. This will benefit the project with global and more effective contribution through skilled developers present worldwide.

II. FUNCTIONS

1. DATA GATHERING AND ANALYSIS

The donors' data will depend on number of user profiles and their blood groups with their last donation date. Once they have registered database will be ready for the recipients. Users will be analyzed and filtered according to their blood groups and current location. This analysis will be done on the server side with respect to the clients' requirements.

2. AREA BASED PLOTTING

After a request has been sent, the request will be displayed on the request news feed. Once recipients select the donor a request will be sent to the selected donor. Now if the donor accepts that request he/she can exchange information using which they can find that exact location and provide assistance. Once the donor responds to the request, the donor's information will be provided but only a specific amount of that info will be given to the recipient i.e. Name, Phone Number and Location.

3. COMMUNICATION BETWEEN THE PEERS

Once the request gets accepted, there comes a necessity to establish a communication medium between the recipient and the donor. For this two features are provided, the chat and the call. The chat features allows interaction through messages within the application itself. A new chat window is provided for each donor/recipient respectively. The call feature allows to call the donor for further communication by providing the donor's registered mobile number to the recipient. These two features are provided to further strengthen the interaction between the people involved at critical time.

4. SECURITY USING GOOGLE API

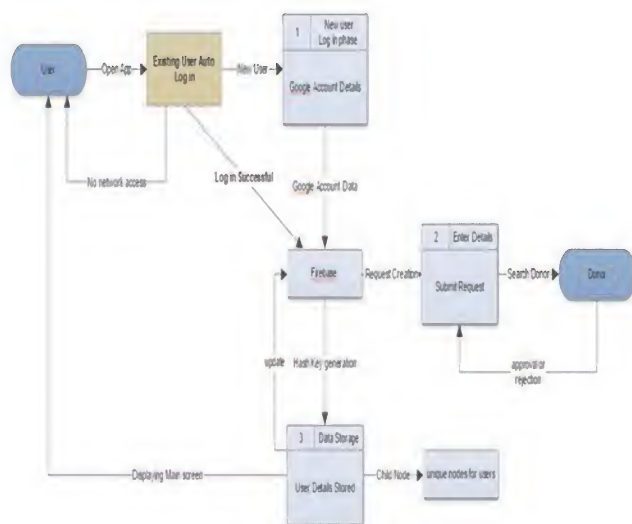
During user registration, it will be mandatory to use a Google email account. For this, the Google Plus API has been integrated along with the application. This allows only legitimate users to register on the application and avoid hoax calls. The user mobile number is also validated using one time password mechanisms for further authentication.

5. FIREBASE NODE USAGE

Firebase is a cloud service which provides dynamic data storage of multiple users and easy storage, search and retrieval facilities. This makes Firebase a prominent data storage facility. A single Firebase node offers up to 100 connections per second in its free edition. The paid version offers hosting and custom domains for over 3000 INR.

III. LOGICAL DESIGN

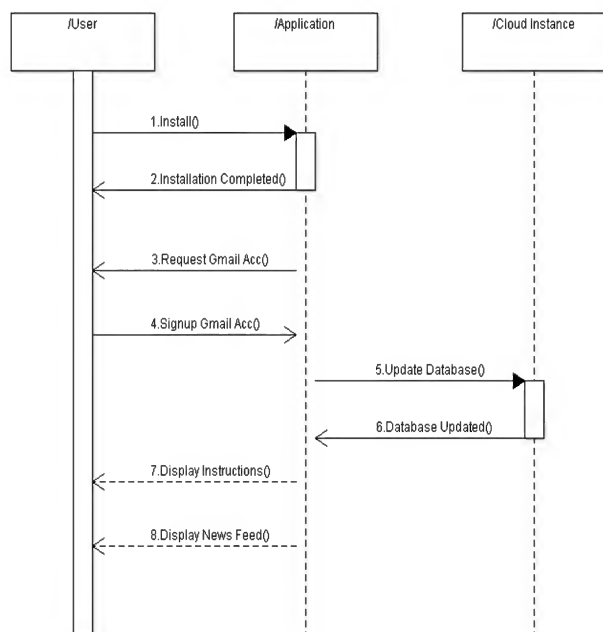
1. Data Flow



The data flow simply describes the flow of the system starting from the user. Once the user accesses the application with his credentials, he will be authenticated and checked whether the user is new or existing. If a new user is found, then all the user details will be stored at the Firebase database and then the user will be redirected accordingly. When the user logs in, he will get access to all the features of the application and can act accordingly.

2. Sequential flow

2.1 Initial phase



2.2 Emergency phase

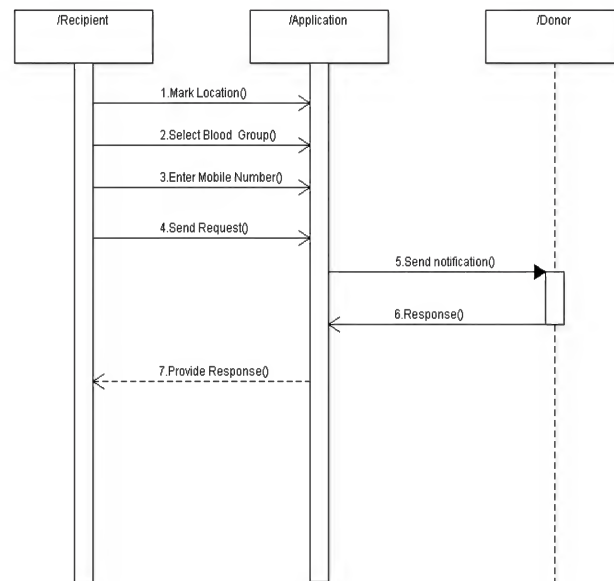


Fig 2.1 describes the transition of activities between the user, application and the Firebase cloud instance during the login phase. Fig 2.2 describes the transition of activities between the donors, the application and the recipients during emergency scenarios.

IV. RESULTS



Fig. 4.1 & 4.2

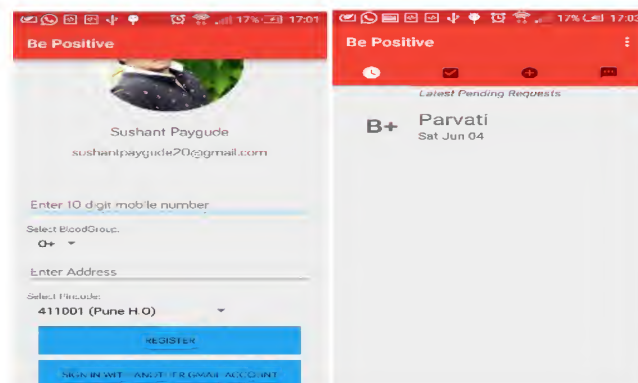


Fig. 4.3 & 4.4

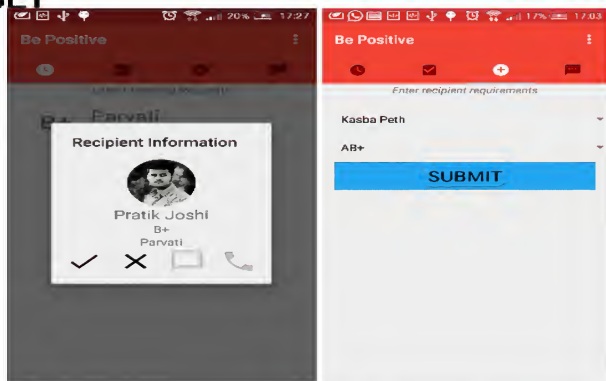


Fig. 4.5 & 4.6

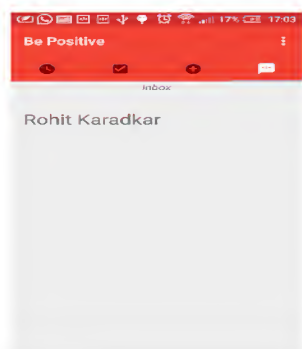


Fig. 4.7

The above screenshots show the actual interface of the application. Fig. 4.1 & 4.2 represent the splash and the login screen. The user enters the application using a valid Google account. The fig 4.3 represents the registration form for a new user, which includes all the required fields along with validation. Once a new user is successfully registered, the data is stored as a Firebase child node. The user is then redirected to the tab layout which includes 4 different tabs-pending, accepted, new & chat. The pending tab displays all the current multiple requests of several users (4.4). To create a new request, user can simply

make a request with the blood group and location details from the third tab (4.6). A potential donor can then select a request and accept or reject the request based on individual preference. Once the user accepts a request, the message and call services are activated. The recipient and the donor can then interact with each other via message service provided in the application itself, or can call each other for further communication (4.5 & 4.7).

V. CONCLUSION

The use of technology is increasing and with it so is the ability to save people's lives. With the help of just a smartphone, the application will reach out hundreds of blood donors and would be an effective tool in helping out patients during emergencies. With the assistance of the proposed application, it will be possible to reduce the number of deaths due to unavailability or delay of blood to patients. The main focus is to create an easy to reach platform between the blood donors and the recipients. Technological progress has provided us with better means of helping mankind.

VI. REFERENCES

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